Amendments to the Drawings

Please accept the attached Replacement Sheet containing FIGS. 15 and 16.

REMARKS/ARGUMENTS

Claims 1-20 of the present application have been rejected by the Examiner. Claims 2, 4 and 16 have also been objected to by the Examiner. Claims 2, 4, and 16 have been amended in view of the objections of the Examiner and claims 1, 12 and 20 have been amended in order to more distinctly claim the subject matter of the applicants' invention.

The Examiner contends that FIGS. 15 and 16 are missing. Originally filed FIGS. 15 and 16 appear in the published U.S. Patent Application Publication No. 2002/0150094. Applicants submitted 30 sheets of formal drawings that were received by the USPTO on April 9, 2002 including formal versions of FIGS. 15 and 16 according to the stamped postcard returned by the USPTO. Applicants resubmit herewith this sheet 8 of the formal drawings containing FIGS. 15 and 16.

Claims 1, 2 and 20 have been rejected under 35 U.S.C. §102(e) as being anticipated by United States Patent No. 4,864,559 to Perlman ("Perlman"). Claims 5-10 have been rejected by the Examiner under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 5,517,494 to Green ("Green"). Claims 11-17 have been rejected under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,141,347 to Shaughnessy et al. ("Shaughnessy"). Claim 3 has been rejected under 35 U.S.C. § 103(a) as being obvious over Perlman in view of Shaughnessy. Claim 4 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Perlman, in view of United States Patent No. 5,361,256 to Doeringer. Lastly, claims 18 and 19 have been rejected under 35 U.S.C. § 103(a) as being obvious over Shaughnessy in view of Green.

With regard to the rejection of claims 1, 2 and 20 in view of the Perlman reference, applicants respectfully disagrees with the position of the Examiner for various reasons set forth below.

With respect to claim 1 the Examiner states that all steps of the claim are taught by Perlman. Perlman describes a method of multicast message distribution wherein a network is broken into areas. Nodes at the lowest level (L1) can communicate only with other L1 nodes in the same area and can only communicate with nodes in the higher level (L2) that are also in the same area. Only level 2 nodes can communicate with level 2 nodes in other areas. Perlman does not teach or suggest the step of identifying a scope region bounded by one or more of the plurality of hierarchical levels in which to route said packets of data. A portion of the network defined as an "area" by Perlman appears to be an arbitrary set of routers in two different hierarchical levels.

There is no teaching or suggestion that a portion of the network could be identified by all routers being at a certain level or levels of the hierarchical network. Furthermore, Perlman neither teaches nor suggests the step of identifying a root identifier for the scope region comprising the subnet. In the present invention, a hierarchical subnet is identified by a root identifier and a scope region. There is no such teaching in Perlman. None of the level 2 nodes (121-127 in FIG. 1 of Perlman) are designated as a root identifier for their respective "areas." In the present invention the root identifier and scope region define the hierarchical subnet to which multicast packets will be distributed. Because Perlman does not teach or suggest the identification of a group of nodes through the use of scope region and root identifier there is no teaching or suggestion of forwarding packets of data from said source to the routers in the network wherein said packets of data contain data fields identifying the scope region and the root identifier of the scope region.

The Examiner points to column 10, lines 18-26 and claim 1 of Perlman as teaching that the message format contains these features. A close reading of Perlman shows that the multicast message format in FIG. 5 that is discussed in column 10 contains only a "LOC-AREA" field 550. The "LOC-AREA" field 550 may have the following values: "if the local area field 550 equals zero then the multicast range is equal to a single link. If the local area 550 equals all ones, then the multicast range is the entire network. All other multicast messages will be distributed to the area specified in the local area field 550." (Perlman, column 10, lines 58-68). There is no discussion as to how the local area is actually identified. Thus, even if the local area were taken to be equivalent to a hierarchical subnet having a root identifier which applicants do not believe is true, there is no teaching or suggestion in Perlman that the scope region and root identifier that identify a subnet are used in forwarding packets of data from said source to the routers in the subnet wherein said packets of data contain data fields identifying the scope region and the root identifier of the scope region of the subnet.

Claim 2 is neither taught nor suggested by Perlman. Claim 2 adds the additional steps of identifying each router in a subnet bounded by the scope region that can send packets of data to or from a router at a higher or lower level as a hierarchical designated router (HDR) and identifying the root identifier for the scope region as the hierarchical designated router directly above the scope region. Perlman neither teaches nor suggests these steps because there is no teaching in Perlman of a root identifier for a subnet. Thus, there is no discussion of a hierarchical designated router. In Perlman any router at level 2 can communicate with any other router at level 2 to which it is connected. There is no designation for an "area" of a root identifier or the notion of an

HDR. That is because the areas in Perlman are not hierarchically organized subnets that could be identified by a root identifier and a scope range as in the present invention.

Claim 20 is neither taught nor suggested by Perlman. Perlman does not teach or suggest a method of forwarding packets of data from a multicast session in a network of routers arranged into a plurality of subnets each having a plurality of hierarchical levels comprising the step of forwarding packets of data between routers, wherein said packets of data contain data identifying a scope region containing the lower and upper hierarchical levels to which the packets will be forwarded, an application identifier for the multicast session and a unique root identifier for the scope region wherein the scope region and the unique root identifier identify the subnet to which packets are forwarded. There is no teaching in Perlman of a subnet as being identified by a root identifier and a scope region and that such information is contained in packets of data to identify the routers to which the data packets will be forwarded in a multicast event.

Claims 5-10 have been rejected by the Examiner under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 5,517,494 to Green ("Green"). There is no discussion in Green of scope region or root identifiers for a scope region because the network in Green is not a hierarchical network as discussed in the present invention. Green does not teach or suggest the use of a join request where a receiver sends the scope region of a hierarchically arranged net or subnet along with the application identifier for a multicasting session to a parent router. There is also no teaching or suggestion in Green of replying to the receiver with the root identifier for the scope region of the subnet once the receiver has successfully joined the multicasting session. Claims 5-10 are neither taught nor suggested by Green.

Claims 11-17 have been rejected under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,141,347 to Shaughnessy et al. Shaughnessy specifically teaches away from the hierarchical network of the present invention. "The present invention [in Shaughnessy] provides a wireless communication system having a non-hierarchical architecture in which mobility processing is distributed, rather than centralized." (column2, lines 45-47). Furthermore, Shaughnessy does not teach or suggest the step of sending a mobility report message from the mobile receiver to the second router wherein the mobility report message contains data identifying the scope region of the multicast session, the application identifier of the multicast session and the root identifier of the scope region. The scope region and the root identifier for the scope region are specific identifiers for identifying a set of nodes in a subnet of a hierarchical network. The Examiner cites column 5, lines 39-67 and column 6, lines 1-19 and claim 11 as teaching this step. Applicants have reviewed this material and do not see any indication of a

scope region and root identifier being transmitted as part of the "affiliation" message. The network in Shaughnessy is not arranges in a hierarchical manner and therefore such content would not be necessary or possible. Shaughnessy does not teach or suggest claim 11.

With respect to claim 12, Shaughnessy neither teaches nor suggest the additional steps of receiving the mobility report message at the second router; determining at the second router if the second router is outside the scope region; or invoking a mobile join operation if the second router is outside the scope region. The Examiner cited FIGS. 4 and 6 and column 5, lines 2-12; column 6, lines 33-41 and lines 54-66 and claim 12 as disclosing these steps. Applicants contend that there is no discussion of the scope region in Shaughnessy. The use of a scope region is not necessary or possible with Shaughnessy because the network is not hierarchical.

With respect to claim 13 the step of invoking a mobile join operation comprising the step of sending a mobile join message from the second router toward a third router toward the router associated with the root identifier. There is no root identifier disclosed in Shaughnessy which is not a hierarchical network. The root identifier is the HDR directly above the scope region that defines the subnet for multicasting purposes in the present invention. None of the cited passages of Shaughnessy describe such a root identifier.

With respect to claim 14, the Examiner cites column 7, lines 27-30 which state that "the reconfiguration request made at step 604 cause [sic] the spanning tree associated with the multicast address to be re-defined to include the multicast router for the site. In claim 14 of the present invention claim 14 requires placing a transient entry in the forwarding cache indicating the router associated with the root identifier as source of data packets to be forwarded to the mobile receiver. Applicants do not see the similarity between the cited passage of Shaughnessy and claims 14. There is no discussion of a transient entry in the forwarding cache related to a root identifier as a source of data packets for a mobile receiver.

The discussion of Shaughnessy with regard to claims 15, 16 and 17 suffer similar deficiencies. The cited passages from Shaughnessy do not teach or suggest the steps of receiving the mobile join message at the third router; determining at the third router whether the third router is the binding point for communication to the mobile receiver wherein the binding point is the router that provides a linkage between the scope region and the mobile receiver through the shortest path or wherein the third router is the binding point if the address of the third router is equal to the root identifier or if the address of any ascendant router in which the third router is in communication is equal to the root identifier.

With respect to claim 3 which has been rejected under 35 U.S.C. § 103(a) as being obvious over Perlman in view of Shaughnessy. First, there is the problem that Shaughnessy teaches away from a hierarchical network and cannot be easily combined with Perlman. Shaughnessy does not overcome the main deficiencies of Perlman as discussed above. At most Shaughnessy teaches the use of a means for mobility but does not teach or suggest the use of a binding point to connect a mobile receiver back to the scope region the mobile receiver has left. There is no scope region in Shaughnessy as it does not teach a hierarchical network.

Claim 4 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Perlman, in view of United States Patent No. 5,361,256 to Doeringer. Claim 4 further comprises, prior to the forwarding step, the steps of receiving a packet of data at a router in the network; determining whether the router is within the scope region specified in the data field identifying the scope region for the packet of data; and, discarding the data packet if the router is outside the scope region. There is no teaching or suggestion of a scope region that defines the levels of a subnet for multicasting purposes in Perlman and Doeringer does not overcome this and other deficiencies in Doeringer. Doeringer does discuss the discarding of packets that do not lie on the branch of a multicast tree that leads to any members of that group. This is different than the present invention in that a multicast tree must be developed in some way and information about the members of the tree must be distributed. In the present invention there is no multicast tree. The members of a multicast group are identified by a scope region and root identifier that are neither taught nor suggested by Perlman or Doeringer, alone or in combination.

Claims 18 and 19 have been rejected under 35 U.S.C. § 103(a) as being obvious over Shaughnessy in view of Green. Green does not overcome the deficiencies discussed above with respect to Shaughnessy and claim 16. Green does not teach or suggest a hierarchical network where multicasting is accomplished through the use of a scope region and a unique root identifier. Green again discusses the joining of a multicast tree and not the hierarchical level-based multicasting method of the present invention.

Applicant hereby requests reconsideration of claims 1-20, in view of the above amendments and discussion, and allowance thereof is respectfully requested.

A three-month extension of time is hereby respectfully requested.

Respectfully submitted,

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